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WASHINGTON, DC 20005

EXAMINER	
PHILPOTT, JUSTIN M	

ART UNIT	PAPER NUMBER
2665	8

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/494,183	OZEKI, YUKIHIRO	
	Examiner	Art Unit	
	Justin M Philpott	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 12-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,12-15 and 17-23* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. In the Amendment filed July 11, 2003, Applicant has canceled claims 6-11, amended claim 12, and added new claims 13-23. Applicant has also amended the specification to correct typographical errors and provide appropriate terminology introduction. Further, Applicant argues that the rejection of claims 1-5 should be withdrawn.

Response to Arguments

2. Applicant's arguments, see pages 11-13, filed July 11, 2003, with respect to the rejection(s)of claim(s) 1-5 under 35 U.S.C. 103(a) as being unpatentable over Applicant's prior art Figure 5 in view of Ellis have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent No. 5,870,213 to Ishikawa et al.

Claim Objections

3. Claim 12 is objected to because of the following informalities: "N modulated N pulse trains" (line 7) should be changed to "N modulated pulse trains". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 12-15 and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art FIG. 5 of the instant application in view of U.S. Patent No. 5,870,213 to Ishikawa et al.

Regarding claim 1, prior art FIG. 5 of the instant application teaches a multiplexer (300) which divides a carrier pulse train having predetermined amplitude into N pulse trains (e.g., N is equal to two), modulates (302, 303) the N pulse trains by N data signals, respectively, to produce modulated N pulse trains, and time-division multiplexes the modulated N pulse trains (see pages 1-3). However, prior art FIG. 5 of the instant application does not teach an amplitude adjuster which implements an amplitude adjustment so that the modulated signals (in this case, modulated N pulse trains) have different amplitudes from each other.

Ishikawa teaches an optical time-division multiplex system (e.g., see FIG. 70 and 75) and, specifically, teaches an amplitude adjuster (e.g., optical amplifier/optical attenuator 256 in col. 31, line 52; see also col. 30, line 15 – col. 33, line 2) which implements an amplitude adjustment so that the transmitted signals have different amplitudes from each other. The teachings of Ishikawa provide improved demultiplexing at the receiving portion by enabling extraction of a clock signal from the transmitted signals (e.g., see col. 31, lines 1-7). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the

teachings of Ishikawa to the system of FIG. 5 of the instant application in order to provide improved demultiplexing at the receiving portion by enabling extraction of a clock signal from the transmitted signals.

Regarding claim 2, in the multiplexer according to prior art FIG. 5 of the instant application the carrier pulse train has a period T between pulses thereof, and the modulated N pulse trains are time-division multiplexed with a phase difference of T/N (pages 1-3).

Regarding claims 3 and 23, the multiplexer according to prior art FIG. 5 of the instant application is indicated as an optical multiplexer (300) which indicates that the pulse train is accordingly an optical pulse train.

Regarding claim 4, in the modulators 302 and 303 of prior art FIG. 5 of the instant application the N pulse trains are modulated by the N data signals through amplitude shift key modulation (page 1, lines 20-25).

Regarding claim 5, while prior art FIG. 5 of the instant application may not specifically disclose that the modulation technique utilized for modulating the N data signals is specifically pulse code modulation, Examiner takes official notice that pulse code modulation is a well known modulation technique frequently used in the art and it would accordingly be obvious to one of ordinary skill in the art to utilize pulse code modulation for modulating the N data signals in prior art FIG. 5 of the instant application.

Regarding claims 12 and 13, prior art FIG. 5 of the instant application in view of Ishikawa teach the system as discussed above regarding claim 1, and further, Ishikawa teaches a demultiplexer (e.g., optical demultiplexer 250 in FIG. 70). Specifically, the demultiplexer (details of which are shown in, e.g., FIG. 97 and described in col. 35, line 62 – col. 36, line 38)

of Ishikawa comprises: a transmitting/blocking section (e.g., optical switch 434) having an input port that receives (e.g., from 430) the multiplexed modulated signal, a control signal (e.g., from 439) corresponding to one of the N modulated signals, and an output port (e.g., to 436) that emits the one of the N modulated signals corresponding to the control signal; a reference section (e.g., timing regenerator 432) which receives the multiplexed modulated signals and generates a reference signal (e.g., to 439) representing the average amplitude of the N modulated signals (e.g., see FIG. 72 wherein the CLK component comprises an average of the amplitudes from g and h); a detection section (e.g., 440) which generates a detection signal (e.g., to 439) with information identifying the one of the N modulated signals that is emitted by the transmitting/blocking section (e.g., 434); a judgment section (e.g., phase shifter 439) which compares the reference signal (e.g., from 432) to the detection signal (e.g., from 440) and generates a judgment signal (e.g., to 434); and a control section (e.g., comprising 439 and 434) which generates the control signal for the transmitting/blocking section on the basis of at least the judgment signal and a select signal (e.g., an implicit function of the optical switch 434 which selects one of the modulated signals for transmission to receiver 436) that designates one of the modulated signals.

Regarding claim 14, Ishikawa teaches a clock extractor and divider (e.g., comprising optical coupler 430 and timing regenerator 432) that receives the multiplexed signals and generates a clock signals from it and dividing the clock signal (e.g., yielding Q/2-Hz, see col. 36, lines 5-6) being supplied to the control section.

Regarding claim 15, Ishikawa teaches the control section (e.g., comprising 439 and 434) comprises means for selectively shifting the phase of the divided clock signal (e.g., via phase

shifter 439) or maintaining the phase substantially unchanged and responsive to the select signal and the judgment signal.

Regarding claims 17 and 18, as discussed above regarding claims 3 and 23, the multiplexer according to prior art FIG. 5 of the instant application is indicated as an optical multiplexer (300) which indicates that the pulse train is accordingly an optical pulse train. Furthermore, Ishikawa teaches either Mach-Zehnder or electric-field absorption optical modulators may be utilized (e.g., see col. 35, lines 37-39). As discussed above, the teachings of Ishikawa provide improved demultiplexing at the receiving portion by enabling extraction of a clock signal from the transmitted signals (e.g., see col. 31, lines 1-7). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ishikawa to the system of FIG. 5 of the instant application in order to provide improved demultiplexing at the receiving portion by enabling extraction of a clock signal from the transmitted signals.

Regarding claim 19, Ishikawa teaches a detector (e.g., optical coupler 430) for receiving a signal and detecting the modulated signals emitted by the optical modulator (e.g., 244, 243).

Regarding claim 20, as discussed above regarding claims 2, 3 and 23, in the multiplexer according to prior art FIG. 5 of the instant application the pulses of the pulse trains are optical pulses and the pulse trains are time-division multiplexed to form the multiplexed pulse train, the pulse trains having pulse periods that are substantially the same. Furthermore, Ishikawa teaches means for generating a sinusoidal signal (e.g., CLK component in FIG. 72) having a period that is substantially the same as the period of the modulated signals. As discussed above, the teachings of Ishikawa provide improved demultiplexing at the receiving portion by enabling

extraction of a clock signal from the transmitted signals (e.g., see col. 31, lines 1-7). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the teachings of Ishikawa to the system of FIG. 5 of the instant application in order to provide improved demultiplexing at the receiving portion by enabling extraction of a clock signal from the transmitted signals.

Regarding claim 21, Ishikawa teaches a clock extractor and divide by two divider (e.g., comprising optical coupler 430 and timing regenerator 432) that receives the multiplexed signal and divides an output signal from the clock extractor to generate the sinusoidal signal (e.g., Q/2-Hz, see col. 36, lines 5-6).

Regarding claim 22, Ishikawa teaches selectively inverting and non-inverting the sinusoidal signal (e.g., see col. 36, line 50 regarding changing the clock signal from 0 to +/-180 degrees).

Allowable Subject Matter

6. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: claim 16 recites, in addition to the limitations recited in claims 13 and 14, the control section comprises a controller that receives the judgment signal and the select signal, a phase shifting component that receives the divided clock signal and an output signal from the controller and that generates a pulse-sieving signal as an output, a phase adjuster that adjusts the phase of the

pulse-sieving signal, and a drive amplifier that receives the phase-adjusted pulse-sieving signal and generates the control signal from it.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,786,918 to Suzuki et al. discloses an optical communications system with amplitude adjusting.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott
JMP

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600